JOURNAL

OF THE

AMERICAN CHEMICAL SOCIETY.

VOL. XIV.—NO. 1.

JANUARY,

1892.

COMMITTEE ON PAPERS AND PUBLICATIONS:

A. C. HALE,
J. F. GEISLER,
A. A. BRENEMAN, Editor.

ABSTRACTOR FOR AMERICAN PATENTS:

J. F. GEISLER.

CONTENTS:

		Page
I.	Proceedings, January Meeting	1
II.	On the Behavior of Antiseptics Toward Salivary Digestion. By H. A. Weber	4
III.	An Improved Burette Holder. By A. A. Breneman	15
IV.	Abstracts of American Patents Relating to Chemistry	17

PUBLISHED MONTHLY.

NEW YORK:
JOHN POLHEMUS PRINTING CO.,
121 Fulton Street.
1892.

The **Journal of the American Chemical Society** appears monthly, except during July and August. It will contain all papers read before the Society, and a list of American Patents relating to Chemical Industries.

The Price of Subscription is $5.00 per year, in advance.

The Meeting Room of the Society is the Law Lecture Room, University Building, Washington Square, New York.

The Regular Monthly Meeting is held on the first Friday of every month, except July and August, at 8 P. M.

Corresponding Secretary:

A. C. HALE, 551 Putnam Ave., Brooklyn, N. Y.

Treasurer:

C. F. McKENNA, 426 E. 23d St., N. Y.

The Library of the Society in the Library Room of the University of the City of New York, is accessible daily, from 10 A. M. to 5 P. M., on Tuesday and Wednesday evenings, and on the evenings of the regular monthly meetings of the Society.

Back numbers of the Journal are sold to Members at $3.00, to others at $5.00, per volume. Apply to the Librarian,

C. E. MUNSELL, 100 Horatio St., N. Y.

The Committee on Papers and Publications respectfully call attention to the resolutions of the Society, requiring that papers be submitted to the Committee before being read.

Authors will be furnished, gratis, with 20 reprints of each article published in the Journal, *if application for the same be made when the article is sent.*

Members are requested to give notice of any change of address, or failure in the delivery of the Journal. All communications relating to the Journal should be addressed to the Editor.

A. A. BRENEMAN, 97 Water St., New York.

Regular Meeting, January 8th, 1892.

The Regular Meeting of the Society was held Friday evening, January 8th, in the Law Lecture Room of the University.

The meeting was called to order at 9 o'clock, Vice-President Breneman in the chair.

The minutes of the Regular December Meeting were read and accepted.

The minutes of the Fourth General Meeting were read, amended, and accepted.

The following members were elected :

E. H. Adams, N. Y. Tartar Co., 9th street and Gowanus Canal, Brooklyn, N. Y.

Wm. N. Berkely, Univ. of Virginia, Virginia.

Prof. J. S. Cassidy, Covington, Ky.

Geo. C. Davis, B. S., Pottsville, Pa.

Prof. Chas. T. P. Fennell, Cincinnati College of Pharmacy, Cincinnati, O.

Chas. R. Findley, Abingdon, Va.

Paul C. Freer, Ann Arbor, Mich.

John G. Hall, Natrona, Pa.

D. W. Hoyt, A. M., Prov. High School, Providence, R. I.

Chas. A. Harper, Cincinnati Univ., Cincinnati, O.

Otis C. Johnson, Ann Arbor, Mich.

Dr. Joseph M. Locke, 58 W. 3d street, Cincinnati, O.

Horatio Loomis, Burlington, Vt.

Oscar Lowman, Ph. D., 115 Jefferson avenue, Detroit, Mich.

W. J. Matheson, 178 Front street, N. Y.

Chas. G. Merrell, Mass. Inst. Tech., Boston, Mass.

Dr. S. B. Newbury, Cornell Univ., Ithaca, N. Y.

David J. Ogilvie, Cincinnati, O.

Pedro J. Sosa, Panama, Columbia, S. A.

Prof. G. G. Pond, State College, Pa.
Dr. Victor C. Vaughan, Ann Arbor, Mich.
Fred. J. Walling, Smith and Bergen streets, Brooklyn, N. Y.
Prof. A. V. E. Young, N. W. Univ., Chicago.

Wm. Dickoré, Ph. D., Prof. Chemistry Miami Med. College, was nominated for membership.

A paper on "The Behavior of Antiseptics towards Salivary Digestion," by H. A. Weber, Ph. D., was read by C. F. McKenna in the absence of the author. After some miscellaneous discussion the meeting was adjourned.

DURAND WOODMAN,
Recording Secretary.

REPORT OF THE TREASURER OF THE AMERICAN CHEMICAL SOCIETY.

Resources.

Cash in Treasury	$275 84
Accounts, 1890	254 20
Dues	35 00
Personal Accounts	166 31
	$731 35

Liabilities.

Subscriptions, Journal	$39 08
Back numbers Journal	12 60
Dues and Initiation Fees	465 13
Personal Accounts	20 17
American Chemical Society	194 37
	$731 35

Gains.

Dues, 1887	$5 00
" 1888	20 00
" 1889	36 68
" 1890	60 00
" 1891	1,144 87
" 1892	175 00
Initiation Fees	140 00
Subscriptions to Journal	114 02
Back numbers Journal	6 00
Diagrams	15 00
Advertisements	283 75
Special Subscription, Philadelphia Meeting	44 00
Interest	5 97
	$2,050 29

Losses.

Expenses, Journal	$1,018 11
" General	277 79
" Reprints	88 95
" Wash. Meeting	64 05
" Phila. Meeting (partial)	39 25
" N. Y. Meeting	56 28
" Election	8 75
" Binding Exchanges	56 65
" Insurance	8 75
Dues	16
American Chemical Society	431 55
	$2,050 29

Cash Receipts.

Cash on hand Dec. 31st, 1890	$95 25
Interest received during year	5 97
Back numbers Journal	6 00
Subscriptions, New York Meeting	75 00
Dues	1,423 59
Initiation Fees	140 00
Subscriptions, proposed dinner in February, 1891	35 00
Sundries	496 16
	$2,276 97

Cash Disbursements.

Cash on hand Dec. 31st, 1891, and paid to Treasurer	$275 84
Binding Exchanges	56 65
Insurance	8 75
Subscriptions, New York Meeting paid to Treasurer of Fund	75 00
Accounts, 1890	254 20
Election expense (partial)	8 75
Subscriptions, proposed dinner in February, 1891, returned	35 00
Sundries	1,562 78
	$2,276 97

FRANK T. KING, *Treasurer.*

Brooklyn, N. Y., Dec. 31st, 1891.

ON THE BEHAVIOR OF ANTISEPTICS TOWARD SALIVARY DIGESTION.

By H. A. Weber,
Prof. Agr. Chem. Ohio State University, Columbus, O.

Among the various causes which injuriously affect public health perhaps none has received less supervision in this country than the practice of food adulteration. A systematic examination of the food commodities as found upon the market reveals a condition of affairs which is simply appalling to one interested in public welfare. The investigations on this subject show conclusively, that nearly all classes of manufactured or prepared articles of food are liable to be found adulterated.

In many cases, it is true, the adulteration is merely fraudulent and not injurious to health, but, on the other hand, a mass of evidence has accumulated to show that for the sake of gain or of advantage over a competitor, the sophisticator of human food will not shrink from employing such means as endanger the health, or even the life, of the consumer.

One class of food adulterations which has been universally employed of late, without restriction, embraces the use of antiseptics for preserving perishable articles of food. This subject is of especial interest at the present time because the practice of employing various antiseptics as food preservatives is not confined to the manufacturer and dealer, but has found its way into private households all over the land, and because the baneful effects of this practice are not fully appreciated or understood by the public. In general only such antiseptics can be employed as are devoid of an appreciable taste and odor and not immediately injurious in their action upon the consumer. Among these substances may be mentioned salicylic acid, boracic acid, borax, calcium sulphite and saccharine.

That saccharine will doubtless come into general use in food and drink may readily be inferred from its extreme sweetness and its antiseptic properties.

The market is full of preparations which contain boracic or salicylic acid or both, and which are sold as lard bleachers, sausage and meat preservatives, fruit, cider and wine preservatives, &c.

A few of these articles, which the writer has examined, may be mentioned here for the sake of illustration.

1. A lard bleacher called "snow white," containing 10.86 per cent. of boracic acid, and 47.12 per cent. borax.

2. A salt, colored pink with cochineal, called B. Savaline, and used as a sausage and meat preservative, containing 16.26 per cent. boracic acid.

3. A sample of anti-ferment for keeping cider sweet, consisting of

Boracic acid	21.6 per cent.
Salicylic "	78.4 "

4. Three preservative salts for meat containing respectively, 31.91, 43.05 and 53.22 per cent. boracic acid.

5. A preparation claimed to be harmless, for meats and other foods, containing :

Boracic acid	25 per cent.
Saltpetre	45 "
Salt	30 "

After H. Leffman and W. Beam (Analyst, Vol. 13, page 103), had shown, that certain antiseptics completely arrested the conversion of starch into grape sugar by diastase and pancreatic extract, the writer naturally inferred that a similar effect would be produced by these substances on the diastatic action of saliva.

At my suggestion, Mr. C. T. Fox, one of my students, took up the matter as a subject for his graduating thesis.

The results of his careful and painstaking work are embodied in part in the following tables.

The method employed was as follows :

1 gram of starch was mixed with 10 c. c. of water, and boiled five minutes; 5 c. c. more of water was added, the liquid was cooled to 40° C., 5 c. c. saliva of the same temperature was added, the mixture was violently shaken and kept at the temperature of 40° C. for the required time, when the action of the saliva was suddenly stopped by heating to the boiling point. The mixture was then neutralized, diluted to 100 c. c. and the sugar was de-

termined by Fehling's solution. At each step parallel tests were made with one gram of pure starch and with one gram of starch containing the indicated amount of preservative, using equal amounts of the same saliva in each case. The preservatives employed were: salicylic acid, boracic acid, calcium sulphite and saccharine.

In the subjoined tables of results (a) represents the amount of sugar obtained from the pure starch, and (b) that obtained from the starch mixed with the varying amounts of the preservatives.

In each step the starch was subjected to the action of the saliva for different lengths of time, viz: 1, 5, 15, 30 and 60 minutes.

TABLE I.

Starch ..... 100 grams.
Salicylic acid ..... 1 gram.
1 part preservative to 2,100 parts food.

Time, 1 minute; grape sugar	a.	7.75 per cent.
	b.	9.61 "
Time, 5 minutes; grape sugar	a.	9.61 "
	b.	10.80 "
Time, 15 minutes; grape sugar	a.	22.77 "
	b.	20.83 "
Time, 30 minutes; grape sugar	a.	26.31 "
	b.	27.77 "
Time, 1 hour; grape sugar	a.	27.67 "
	b.	33.33 "

TABLE II.

Starch ..... 100 grams.
Borax ..... 1 gram.
1 part preservative to 2,100 parts food.

Time, 1 minute; grape sugar	a.	12.82 per cent.
	b.	9.10 "
Time, 5 minutes; grape sugar	a.	20.83 "
	b.	14.70 "
Time, 15 minutes; grape sugar	a.	28.15 "
	b.	13.51 "
Time, 30 minutes; grape sugar	a.	25.00 "
	b.	16.66 "
Time, 1 hour; grape sugar	a.	35.04 "
	b.	27.38 "

TABLE III.

Starch	100 grams.
Calcium sulphite	1 gram.

1 part preservative to 2,100 parts food.

Time, 1 minute; grape sugar	a. 12.82	per cent.
	b. 14.70	"
Time, 5 minutes; grape sugar	a. 20.83	"
	b. 17.86	"
Time, 15 minutes; grape sugar	a. 28.15	"
	b. 22.56	"
Time, 30 minutes; grape sugar	a. 25.00	"
	b. 20.83	"
Time, 1 hour; grape sugar	a.	
	b.	

TABLE IV.

Starch	100 grams.
Saccharine	1 gram.

1 part preservative to 2,100 parts food.

Time, 1 minute; grape sugar	a. 12.82	per cent.
	b. 19.20	"
Time, 5 minutes; grape sugar	a. 20.83	"
	b. 30.06	"
Time, 15 minutes; grape sugar	a. 28.15	"
	b. 25.51	"
Time, 30 minutes; grape sugar	a. 25.00	"
	b. 23.80	"
Time, 1 hour; grape sugar	a. 35.04	"
	b. 25.51	"

TABLE V.

Starch	50 grams.
Salicylic acid	1 gram.

1 part preservative to 1,050 parts food.

Time, 1 minute; grape sugar	a. 10.62	per cent.
	b. 10.86	"
Time, 5 minutes; grape sugar	a. 33.83	"
	b. 27.70	"
Time, 15 minutes; grape sugar	a. 33.01	"
	b. 38.40	"

TABLE V.—*Continued.*

Time, 30 minutes; grape sugar	a. 34.48	per cent.
	b. 34.48	"
Time, 1 hour; grape sugar	a. 41.66	"
	b. 41.66	"

TABLE VI.

Starch	50 grams.
Borax	1 gram.

1 part preservative to 1,050 parts food.

Time, 1 minute; grape sugar	a. 10.62	per cent.
	b. 13.90	"
Time, 5 minutes; grape sugar	a. 33.33	"
	b. 14.28	"
Time, 15 minutes; grape sugar	a. 33.01	"
	b. 18.51	"
Time, 30 minutes; grape sugar	a. 34.48	"
	b. 27.77	"
Time, 1 hour; grape sugar	a. 41.66	"
	b. 29.41	"

TABLE VII.

Starch	50 grams.
Calcium sulphite	1 gram.

1 part preservative to 1,050 parts food.

Time, 1 minute; grape sugar	a. 10.62	per cent.
	b. 10.41	"
Time, 5 minutes; grape sugar	a. 33.33	"
	b. 28.40	"
Time, 15 minutes; grape sugar	a. 33.01	"
	b. 26.29	"
Time, 30 minutes; grape sugar	a. 34.48	"
	b. 38.46	"
Time, 1 hour; grape sugar	a. 41.66	"
	b. 30.71	"

TABLE VIII.

Starch	50 grams.	
Saccharine	1 gram.	
1 part preservative to 1,050 parts food.		
Time, 1 minute; grape sugar	a. 10.62	per cent.
	b. 12.50	"
Time, 5 minutes grape sugar	a. 33.33	"
	b. 35.71	"
Time, 15 minutes; grape sugar	a. 33.01	"
	b. 35.71	"
Time, 30 minutes; grape sugar	a. 34.48	"
	b. 34.40	"
Time, 1 hour; grape sugar	a. 41.66	"
	b. 40.32	"

TABLE IX.

Starch	40 grams.	
Salicylic acid	1 gram.	
1 part preservative to 840 parts food.		
Time, 1 minute; grape sugar	a. 16.66	per cent.
	b. 2.84	"
Time, 5 minutes; grape sugar	a. 20.00	"
	b. 3.52	"
Time, 15 minutes; grape sugar	a. 26.31	"
	b. 14.28	"
Time, 30 minutes; grape sugar	a. 31.25	"
	b. 23.80	"
Time, 1 hour; grape sugar	a. 38.45	"
	b. 35.71	"

TABLE X.

Starch	40 grams.	
Borax	1 gram.	
1 part preservative to 840 parts food.		
Time, 1 minute; grape sugar	a. 16.66	per cent.
	b. 4.46	"
Time, 5 minutes; grape sugar	a. 20.00	"
	b. 8.33	"

TABLE X.—*Continued.*

Time, 15 minutes; grape sugar	a. 26.31	per cent.
	b. 19.22	"
Time, 30 minutes; grape sugar	a. 31.25	"
	b. 27.27	"
Time, 1 hour; grape sugar	a. 38.45	"
	b. 33.34	"

TABLE XI.

Starch	40 grams.
Calcium sulphite	1 gram.

1 part preservative to 840 parts food.

Time, 1 minute; grape sugar	a. 16.66	per cent.
	b. 12.19	"
Time, 5 minutes; grape sugar	a. 20.00	"
	b. 22.72	"
Time, 15 minutes; grape sugar	a. 26.37	"
	b. 29.35	"
Time, 30 minutes; grape sugar	a. 37.25	"
	b. 33.33	"
Time, 1 hour; grape sugar	a. 38.45	"
	b. 38.40	"

TABLE XII.

Starch	40 grams.
Saccharine	1 gram.

1 part preservative to 840 parts food.

Time, 1 minute; grape sugar	a. 16.66	per cent.
	b. 22.72	"
Time, 5 minutes; grape sugar	a. 20.00	"
	b. 29.41	"
Time, 15 minutes; grape sugar	a. 36.31	"
	b. 35.71	"
Time, 30 minutes; grape sugar	a. 31.25	"
	b. 35.71	"
Time, 1 hour; grape sugar	a. 38.45	"
	b. 41.66	"

TABLE XIII.

Starch	20 grams.
Salicylic acid	1 gram.

1 part preservative to 420 parts food.

Time, 1 minute; grape sugar	a.	7.14 per cent.
	b.	None.
Time, 5 minutes; grape sugar	a.	20.83 "
	b.	None.
Time, 15 minutes; grape sugar	a.	26.31 "
	b.	None.
Time, 30 minutes; grape sugar	a.	30.00 "
	b.	None.
Time, 1 hour; grape sugar	a.	36.76 "
	b.	None.

TABLE XIV.

Starch	20 grams.
Borax	1 gram.

1 part preservative to 420 parts food.

Time, 1 minute; grape sugar	a.	7.14 per cent.
	b.	Trace.
Time, 5 minutes; grape sugar	a.	20.83 "
	b.	10.00 "
Time, 15 minutes; grape sugar	a.	26.31 "
	b.	13.88 "
Time, 30 minutes; grape sugar	a.	30.00 "
	b.	29.23 "
Time, 1 hour; grape sugar	a.	36.76 "
	b.	31.22 "

TABLE XV.

Starch	40 grams.
Calcium sulphite	1 gram.

1 part preservative to 420 parts food.

Time, 1 minute; grape sugar	a.	7.14 per cent.
	b.	7.81 "
Time, 5 minutes; grape sugar	a.	20.83 "
	b.	28.73 "

TABLE XV.—*Continued.*

Time, 15 minutes; grape sugar	a.	26.31 per cent.
	b.	27.78 "
Time, 30 minutes; grape sugar	a.	30.00 "
	b.	35.71 "
Time, 1 hour; grape sugar	a.	36.76 "
	b.	35.71 "

TABLE XVI.

Starch	20 grams.
Saccharine	1 gram.

1 part preservative to 420 parts food.

Time, 1 minute; grape sugar	a.	7.14 per cent.
	b.	None.
Time, 5 minutes; grape sugar	a.	20.83 "
	b.	None.
Time, 15 minutes; grape sugar	a.	26.31 "
	b.	None.
Time, 30 minutes; grape sugar	a.	30.00 "
	b.	None.
Time, 1 hour; grape sugar	a.	36.76 "
	b.	None.

TABLE XVII.

Starch	10 grams.
Salicylic acid	1 gram.

1 part preservative to 210 parts food.

Time, 1 minute; grape sugar	a.	19.83 per cent.
	b.	None.
Time, 5 minutes; grape sugar	a.	12.82 "
	b.	None.
Time, 15 minutes; grape sugar	a.	21.30 "
	b.	None.
Time, 30 minutes; grape sugar	a.	33.35 "
	b.	None.
Time, 1 hour; grape sugar	a.	38.45 "
	b.	None.

TABLE XVIII.

Starch ..... 10 grams.
Borax ..... 1 gram.

1 part preservative to 210 parts food.

Time, 1 minute; grape sugar	a. 19.83	per cent.
	b. None.	
Time, 5 minutes; grape sugar	a. 12.82	per cent.
	b. Trace.	
Time, 15 minutes; grape sugar	a. 21.30	per cent.
	b. 8.92	" "
Time, 30 minutes; grape sugar	a. 33.35	per cent.
	b. 17.85	" "
Time, 1 hour; grape sugar	a. 38.45	" "
	b. 29.41	" "

TABLE XIX.

Starch ..... 10 grams.
Calcium sulphite ..... 1 gram.

1 part preservative to 210 parts food.

Time, 1 minute; grape sugar	a. 19.83	per cent.
	b. Trace.	
Time, 5 minutes; grape sugar	a. 12.82	per cent.
	b. Trace.	
Time, 15 minutes; grape sugar	a. 21.30	per cent.
	b. 22.72	" "
Time, 30 minutes; grape sugar	a. 33.35	" "
	b. 31.25	" "
Time, 1 hour; grape sugar	a. 38.45	" "
	b. 31.25	" "

TABLE XX.

Starch ..... 10 grams.
Saccharine ..... 1 gram.

1 part preservative to 210 parts food.

Time, 1 minute; grape sugar	a. 19.83	per cent.
	b. None.	
Time, 5 minutes; grape sugar	a. 12.82	per cent.
	b. None.	

TABLE XX.—*Continued.*

Time, 15 minutes; grape sugar	a. 21.30 per cent. b. None.
Time, 30 minutes; grape sugar	a. 33.35 per cent. b. None.
Time, 1 hour; grape sugar	a. 38.45 per cent. b. None.

From the inspection of the tables it will be seen, that when the preservatives were present in the proportion of one part to 210 parts of the food mixture the diastatic action of the saliva was completely arrested, *in each case* for the periods of one minute and five minutes. For the other periods of time the calcium sulphite was without effect, borax retarded the action to the end, while in the case of salicylic acid and saccharine not a trace of sugar was formed even in the one hour period.

When the amount of the preservatives employed equalled 1 part to 420 parts of the food mixture not a trace of sugar was formed, even in the one hour period, in the case of salicylic acid and saccharine. Borax completely arrested the diastatic action for the remaining periods up to the hour period. In this proportion calcium sulphite was without effect.

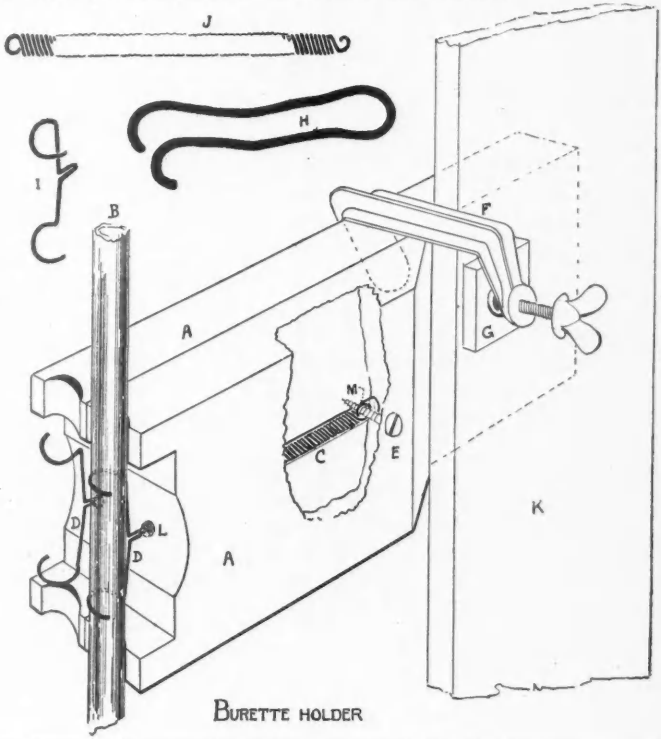
Where the proportion of the preservative was 1 to 840 parts of the food mixture, salicylic acid almost stopped the action of saliva for the periods of one and five minutes and appreciably retarded it for the remaining periods. Borax had a very depressing effect for the one, five and fifteen minutes periods with less marked results in the thirty and sixty minutes periods. Calcium sulphite and saccharine were without effect.

Where the proportion was one of preservative to 1050 of food mixture borax alone showed a depressing effect. The results with borax are also shown to be similar to the last, when the preservative present amounted to only 1 part in 2100 parts of the food mixture.

AN IMPROVED BURETTE HOLDER.*

By A. A. Breneman.

The burette holder shown in the cut is a modified form of one that I have seen, but of which I do not know the origin. The original features of the present one are the use of a spiral spring much longer than in the original holder, imbedded in a wooden block which can be clamped at will to the upright part of any laboratory shelf, thus dispensing with a stand and leaving the table clear, while not interfering with the use of the shelf, and of the combination of two holders in one, as shown in the cut.



Burette holder

*Read at the regular meeting, December 4, 1891.

The springs C, J, which are 10–12 cm. long, are made of hard brass wire of about 8 mm. diameter, coiled as closely as possible. One end M, terminating in a closed loop is sunk into a deep longitudinal hole L, parallel with the axis of the block. The loop is held firmly by a screw which passes through it from the outside. The spring, when not extended, reaches within 1 c.m. of the opening. The stirrup I, is connected with it by its middle loop and is then held so as to support even a very small tube within its rings by drawing the tube against the jaws of the block.

The grooves are faced with cork, first glued in place and then shaped with a round file. These are afterwards well rubbed with melted paraffine as is also the entire surface of the wooden block, thus affording protection against acid or caustic solutions. The wire portions are lacquered, or better, plated with platinum. The rings of the stirrup are bent to an arc of about 250°. The entire block is 23 cm. long, 10 cm. wide, and 5 cm. thick. The beveled portion is 15 x 10 x 2.5 cm.

The large double hook H, is an indispensable part of the holder. Introduced at the side of the stirrup, opposite the opening of the rings, it is used to draw the stirrup forward for the removal or insertion of a burette.

The readiness with which burettes can be moved up or down, or rotated, with a single movement and with one hand, is a marked advantage of this holder. The superiority of wire over silk or catgut, sometimes used in burette stands, will be apparent, and the clearness of view afforded, as compared with the use of the usual burette clamp, is another advantage.

The holder is held in place against the upright part of the shelf by a common iron clamp F, readily obtained of any hardware dealer. A small block of wood G, 3x3x1 cm., with a hole running partly through it, serves as a socket for the end of the screw to prevent defacing of the shelf to which the holder is attached.

Abstracts of American Patents Relating to Chemistry.

(From the U. S. Patent Office Gazette.)

January 5, 1892.

466,323.—Process of manufacturing water gas. Walton Clark, Philadelphia, Pa.

466,325.—Method of enameling sheet metal ware. Hubert Claus, Thale-in-the Harz, Germany.

The process consists in "coating the article with a groundwork of enamel; second, treating the surface thus coated with a repellent solution of ammonium sulphate and epsom salts; third, coating the article with a coarsely ground gray enamel and finally glazing or coating the article with a thin paste of translucent enamel."

466,441 and 466,442.—Apparatus and process for hardening steel. George F. Simonds, Fitchburg, Mass.

466,452.—Process of reducing oxides of iron. Thomas S. Blair, Jr. Allegheny, Pittsburg, Pa.

The heated oxides are subjected to a current of a reducing gas heated to the temperature of the ore when at a red heat. The reduced sponge is then subjected to a current of a cold non-oxidizing gas until sufficiently cool to prevent oxidation when exposed to the atmosphere.

466,455.—Method of forming alloys. Sherwood E. Chusman, Kansas City, Mo.

The method consists in "precipitating copper from a solution of its sulphate, adding mercury, and then an insoluble arsenite suspended in alkiline liquid to the amalgam, followed by the addition of the metal with which, in addition to copper, it is desired to form an alloy, and subsequently removing the mercury.

466,460.—Art of electrolytic decomposition. Thomas A. Edison, Menlo Park, N. J.

Substances not readily decomposed at a low temperature are confined in a suitable vessel and heated sufficiently to vaporize the material and cause pressure in the vessel, thus raising the temperature above the boiling point of the liquid. An electric current is then passed through the highly heated substance.

466,483.—Transfer copying compound. Ernest Asmy, Milwaukee, Wis.

A preparation compounded of glycerine, gum arabic, isinglass, ammonia, oil, alcohol and wax.

466,484.—Centrifugal liquid separator. Clemens Von Bechtolsheim, Stockholm, Sweden.

466,495.—Process of separating nickel from its ores. Henri L. Heuenschmidt, Petit-Querilly, France.

466,498.—Hydrocarbon burner. John A. Lannert and William R. Jeavons, Cleveland, Ohio.

466,513.
466,514. —Ore separators. Charles J. Reed, Orange, N. J.
466,515.

466,524.—Method of preserving corpses. Graham H. Hamrick, Philippi, W. Va.

A cavity of the body is opened and treated to a solution of saltpetre and then the entire body subjected to the fumes of burning sulphur in a suitable chamber.

466,534.—Art of preparing and transferring photographic and other designs for engraving. William J. Charlton, Providence, R. I.

466,557.—Process of duplicating typewritten work. Albert B. Dick, Chicago, Ill.

466,579.—Process of and apparatus for treating garbage. Charles F. Simonin and Isaac M. Simonin, Philadelphia, Pa.

466,603.—Gas producer. Charles Fiesse, New York, N. Y.

466,632.—Apparatus for refining sugar in loaf form. Carl Steffer, Vienna, Austria, Hungary.

466,664.—Electric Battery. Patrick B. Delaney, South Orange, N. J.

466,676.—Brick kiln. John B. Griswold, Zanesville, Ohio.

466,707.—Process of preparing phenol sulphonates of oxychinoline. Josef. Ziegler, Bieberich, Germany.

The process consits in "the production of ortho-oxychinoline by digesting ortho-amidophenol-parasulphonic acid,

$$C_6 H_3 . OH . NH_2 . SO_3 . H.$$
$$1 : 2 : 4,$$

with ortho-nitrophenol-parasulphonic acid and with glycerine and sulphuric acid, precipitating from the product of the reaction, by means of soda, the oxychinoline formed, and purifying the same and heating the oxychinoline so obtained with ortho- or para-phenol sulphonic acid in molecular proportions until the combination of the two bodies is complete.

466,708.—Process of preparing oxychinoline sulphate. Josef Ziegler, Bieberich, Germany.

466,709.—Process of purifying water. Joseph A. Bradburn, Edward N. Trump, and John D. Pennock, Syracuse, N. Y.

The sulphates are precipitated with barium bicarbonate and the carbonates by milk of lime, thus removing the scale forming substances.

466,720.—Process of obtaining insoluble chlorides by electrolysis. Stanley C. C. Currie, Philadelphia, Pa.

The method of producing insoluble chlorides direct from the metals consists in constituting the metal or metals to be converted into a chloride or chlorides, the anode in an electrolytic cell in a neutral chloride solution, and then converting the metals into an insoluble chloride or chlorides.

466,753.—Ore slimer. Edgar A. Hockley, Ouray, Ohio.

January 12, 1892.

466,782.—Plastering composition. Arthur L. Grant, Toronto, Canada.

A composition of sodium or potassium oleate united with lime, suitable for mixture with plastering compositions.

466,820.—Battery-zinc and method of making the same. John Beattie, Jr., Fall River, Mass.

An amalgam of zinc, mercury, and magnesium. Divided zinc and mercury are subjected to the action of a solution of sulphuric acid and water until partial amalgamation takes place. The liquid is then drawn off and the metal heated until it melts, after which a quantity of magnesium is added and the whole cast into blocks or strips; a number of these are then added to pure molten zinc and then cast into the required form.

466,826.—Blue red dye. Edward Hepp, Bieberich-on-the-Rhine, Germany.

A red crystalline compound represented by the formula C_{28} H_{16} N_3 $(SO_3\ H)_3$, being the red basic coloring matter termed "phenyl-rosinduline." With concentrated sulphuric acid it gives a strong green solution. It is easily soluble in cold water, but completely insoluble in sulphuric or hydrochloric acid diluted with about the same quantity of water. Its potassium, sodium and ammonium salts are crystalline and very soluble in cold water, are precipitated from aqueous solutions by means of common salt and impart red-bluish shades to wool.

466,841.—Red azo dye. Moritz Ulrich, Elberfeld, Germany.

The azo dye which results in combining molecular proportions of toluidine sulpho acid after diazotation and of the dihydroxynapthaline monosulphonic acid described in patent No. 444,679. The dye in a dry state is a gray-violet amorphous powder, is easily soluble in water with bluish-red, exquisitely clear and pure in color. Readily sol. in soda-lye and ammonia with red color, while in conc. sulphuric acid it gives a deep bluish-violet colored solution.

466,852.—Disulpho-acid of phenyl-rosinduline. Edward Hepp, Bieberich-on-the-Rhine, Germany.

466,881.—Ore feeder. John R. Russell, San Francisco Cal.

466,882.—Rotary ore roaster. Julius E. Shettle, Salt Lake City, Utah.

466,900.—Absorbent of nitro-glycerine. Lewis Brown, Landing, N. J.

Absorbent is a mixture of nitrate of soda, wood pulp, glue and magnesia.

466,913.—Carbonate of guaiacol and creosol. Bueno R. Seiffert, Rodebeul, Germany.

A colorless crystalline powder, insoluble in water and soluble in alcohol and ether.

466,927.—Process of manufacturing steel. Henry C. S. Dyer, Westhope, England.

The process consists in "charging scrap or pig iron and scrap along with carbon in the form of coke or charcoal or other carbonaceous matter into a basic lined open-hearth furnace, then melting the metal in the charge and finally boiling down the charge with iron ore until the metal contains the percentage of carbon desired."

466,982.—Apparatus for disintegrating vegetable substances. John MacCormack and Harry L. Van Zile, Albany, N. Y.

467,041.—Method and apparatus for the manufacture of lead fibre. Norman K. Morris, Denver, Colo.

467,042.—Method of and apparatus for producing lead carbonate. Norman K. Morris and John W. Bailey, Denver, Colo.

467,090.—Method of transferring designs to glass, porcelain or other surfaces. Albert E. Frank and Edward H. Hoad, Pittsburg, Pa.

Paper is first coated with a soluble surfacing or glaze, then with a less soluble surfacing or glaze, the designs are printed on said coated surface, applied directly to the surface to be decorated, and moistened to permit removal of the paper.

467,140.—Alloy. Edward C. Miller; East Orange, N. J.

An anti-friction metal consisting of lead, eighty parts; antimony, fifteen parts; tin, five parts.

46,7142.—Chemical fire extinguisher. William F. Singer, Carthage, N. Y.

January 19th, 1892.

467,147.—Process of manufacturing steel. Thomas S. Blair, Jr., Allegheny, Pa.

467,158.—Apparatus for treating ores. John D. Coplen, Denver, Colo.

467,162.—Tetrazo dye. Carl Duisberg, Elberfeld, Germany.

A direct dyeing tetrazo dyestuff made by "combining with one molecular proportion of dianisidine after its diazotation, one molecular proportion of beta-napthol disulpho acid R, and then one molecular proportion of alpha-napthol alpha-monosulphonic acid (Neville-Winther.)

A blackish brown amorphous powder with copper like lustre, sparingly sol. in cold water, more readily, with greenish blue color, in hot water; in solutions of the fixed alkalies it dissolves with bluish-red, but in ammonia

with reddish violet and in conc. sulphuric acid with greenish blue color, from which latter solution dark blue flakes separate on the addition of large quantities of water. Mineral acid causes a blue precipitate in the aqueous solution of the dyestuff.

467,167.—Disinfecting apparatus. Albert C. Haven, West Bay City, Mich.

467,169.—Filament for incandescent electric lamps. Philip Hickley, Evanston, Ill.

A filament of the carbonized root of the *Oryza sativa* or rice plant.

467,170.—Concrete mixing machine. Wright S. Hotchkins, Wichita, Kans.

467,171.—Process of chloridizing ores of precious metals. Charles A. Hoyt, Butte City, Mont.

467,200.—Process of treating leather. Federick Riegert, St. Joseph, Mo.

Process of rendering leather pliable and waterproof; consists in first drying the cleaned leather, then applying dissolved rubber or Brazilian gum in a liquid state to the heated leather, then applying oil thereto and finally rubbing powdered soapstone to the leather thus treated.

467,233.—Process of electric metal working. Hermann Lemp, Lynn, and Walter S. Moody, Chelsea, Mass.

467,239.—Battery zinc. Charles B. Schoenmehl, Waterbury, Conn.

467,240.—Electric battery. Charles B. Schoenmehl, Waterbury, Conn.

467,264.—Method of purifying smoke. Albert Raymond, Chicago, Ill.

467,266.—Process of manufacturing gas. John H. Springfellow, London, England.

467,302.—Mixing machine for asphalt. John B. Pitchford, San Francisco and Augustus S. Cooper, Santa Barbara, Cal.

467,308.—Method of producing ferments. Ludwig Meyer, Stuttgart, Germany.

467,312.—Apparatus for separating gluten from slaughter house washings. Edward J. Pope, Eau Claire, Wis.

467,329.—Alloy. William J. Miles, Jr., Terre Haute, Ind.

A non oxidizing alloy composed of osmium, iron or steel, tungsten, nickel and aluminium.

467,356.—Enameling. Carl F. Pauls, Chicago, Ill.

467,361.—Process of treating powdery iron ore. Joel Wilson, Dover, N.J.

467,368.—Mill for crushing ores. William H. Coward, Bath, Eng.

467,372.—Galvanic battery. Fernand Gardson, Bordeaux, France.

467,378.—Art of manufacturing linoleum. Thomas Mitchell, London, Eng.

467,413.—Heating and puddling furnace. Owen Hughes, Cleveland, Ohio.

467,430.—Mash distilling apparatus. Wilhelm Paulzow, Revel, Russia.

467,484.—Electrolytical process and apparatus. Otto Stahlmann, Anaconda, Mont.

January 26th, 1892.

467,492.—Material for manufacturing paving blocks. Noble T. Barnes, Buffalo, N. Y.

467,493.—Method and apparatus for treating Yucca fiber. John C. Best and George W. Anderson, Raytown, Mo.

467,520.—Composition of matter for insulating purposes. David H. Piffard, Piffard, N. Y.

Compounded of rubber 5 parts, rosin 24 parts, and plaster of paris (or its equivalent) 26 parts.

467,543-44-45-46-47.—Apparatus for charging secondary batteries. Cyprien O. Mailloux, New York, N. Y.

467,569.—Ore concentrator. George J. Parker and Charley B. Walker, Trinidad, Colo.

467,575.—Disinfecting device. Alexander S. Force, Jersey City, N. J.

467,605.—Process of and apparatus for purifying gas. Frederick Bredel, Milwaukee, Wis.

467,641.—Process for preserving fruit. Maggie Marshfield, Chicago, Ill.

The process consists in steaming the fruit over sirup containing flavoring extract and allowing the drippings from the fruit to fall into the sirup, and when the fruit is thoroughly cooked and the sirup evaporated to the proper consistency adding the fruit to the sirup while both are hot.

467,645.—Magnetic separator. Francis H. Richards, Hartford, Conn.

467,673.—Carbonic acid gas generator. Patrick J. McGuire, Salem, Mass.

467,745.—Smoke consumer. David C. Adams, Toronto, Canada.

467,747.—Malt kiln. John F. Dornfeld, Watertown, Wis.

467,757.—Method of preparing and bottling wines. George W. Sessions, New York, N. Y.

467,800.—Process of tinning plate. James Gould, Jr., Maywood, Ill.

467,801.—Tinning. James Gould, Jr., Maywood, Ill.

467,833.—Magnetic separator. Francis H. Richards, Hartford, Conn.

467,890.—Duplicating stenciling material. William G. Fuerth, Newark, N. J.

J. F. G.